Resource 6: “Hook” for SBI 3U1 Genetic Processes

Category: Basic Concepts of Science

Extracting DNA from Strawberries

Introduction: DNA is found in every cell in our bodies, yet we are never able to see it or describe what it looks like. In this activity we will extract real DNA from strawberry cells to help us understand what these mysterious pieces of life really look like.

Learning Goals:

* Examine what DNA looks like once extracted from strawberries
* Learn the scientific procedure behind DNA extraction
* Understand the purpose of each of the materials in DNA extraction

Question: Before completing the procedure, write out a few sentences describing what you think DNA looks like.

Materials:

For each student:

* 1 strawberry
* Ziploc bag
* 1 15 ml centrifuge tube
* 1 test tube
* 1 piece of paper towel
* 10 ml extraction buffer (teacher has prepared)
* 1 glass stirring rod
* 1 microcentrifuge tube

Extraction Buffer Recipe (already prepared by teacher)

* 450 ml distilled water
* 10 g table salt
* 50 ml Dawn dishwashing detergent

For class to share:

* clean bowl
* 90% ice cold rubbing alcohol or ethanol
* eye droppers for dispensing solutions

Procedure:

1. Place a strawberry in the Ziploc bag, squeeze out the air and seal the bag. Using your hands, crush the strawberry into juice and pulp while being careful not to puncture the bag.
2. Open the bag and add 10 ml of extraction buffer (approximately 10 full eyedroppers). Seal the bag and GENTLY mix the strawberry juice with the buffer.
3. Create a filtration system by wrapping the paper towel around your finger and placing your paper towel-wrapped finger into the 15 ml tube. Remove your finger to reveal a well in which the juice can be poured.
4. Pour the strawberry juice and extract into the well in the paper towel. Allow the juice to drip through the paper towel for 3-5 minutes.
5. Throw out the paper towel and the Ziploc bag.
6. Transfer the liquid from the 15 ml tube into the test tube until the test tube is around ONE THIRD full.
7. Slowly add 3 ml of ice cold alcohol (using eyedroppers) into the test tube. The alcohol should trickle down the side of the test tube. You should now have a red bottom layer, and a clear top layer.
8. Observe the clear top layer for 2-3 minutes for any changes occurring.
9. Insert a stirring rod into the tube and swirl around. This will spool the DNA around the stick. Pull the DNA out of the tube where you may observe and touch. DNA can be stored in a microcentrifuge tube filled with alcohol.
10. If desired, attach a string to the microcentrifuge tube to keep DNA on a necklace!
11. Clean work area and think about the following questions.

QUESTIONS FOR GROUP DISCUSSION

* Did the DNA extracted look similar to what you predicted before the procedure?
* Why is it necessary to mash the strawberries?
* What is the purpose of the detergent?
* What is the purpose of the salt?
* Is the DNA that you extracted pure? What else might be attached to the DNA?
* Why might some people get more DNA than others?

Source:

http://www.mysciencebox.org/book/export/html/320